CLAIMS

What is claimed is:

1. A method for generating accessory power from a gas turbine engine comprising the steps of:

monitoring at least one parameter which provides information about an incipient change in power demand;

bleeding air from said engine during a transient state in response to said at least one monitored parameter; and

supplying said bleed air to a pneumatically operated means for generating power to operate equipment onboard an aircraft.

2. A method according to claim 1, wherein said monitoring step comprises inputting cockpit signals which indicate an aircraft power demand change to a full authority digital engine control device.

3. A method according to claim 1, wherein said monitoring step comprises inputting a signal from an electrical power generator control device indicating a power demand change to a full authority digital engine control device.

4. A method according to claim 1, wherein said monitoring step comprises inputting a signal representative of a torque change on a drive shaft indicating a power demand change to a full authority digital engine control device.

5. A method according to claim 1, wherein said monitoring step comprises inputting a signal representative of a power demand of at least one electrical generator to a full authority digital engine control device.

6. A method according to claim 1, wherein said monitoring step comprises inputting at least one signal representative of a power demand change to an electronic control device and said bleeding step comprises providing an output signal from said electronic control device to a

control valve to enable a flow of said bleed air from a high pressure compressor of said engine to said pneumatically operated device.

7. A method according to claim 6, further comprising feeding back a signal representative of control valve position to said electronic control device.

8. A method according to claim 1, wherein said supplying step comprises supplying said bleed air to a pneumatically integrated generator for supplying power to drive at least one accessory attached to a gearbox.

9. A method according to claim 8, further comprising generating electrical power with said pneumatically integrated generator and supplying said electrical power to said at least one accessory.

10. A method according to claim 8, further comprising generating mechanical shaft power with said pneumatically integrated generator and supplying said mechanical shaft power to said gearbox for driving a power transfer arrangement for providing power to said at least one accessory.

11. A method according to claim 1, wherein said supplying step comprises supplying said bleed air to an air turbine mounted to a gearbox for generating mechanical shaft power for driving at least one accessory via a power transfer arrangement.

12. A method according to claim 11, wherein said accessory comprises a generator mounted to said gearbox and further comprising delivering said mechanical shaft power generated by said air turbine to said generator.

13. A method according to claim 1, wherein said supplying step comprises supplying said bleed air to an air turbine connected to a gearbox by at least one shaft for providing mechanical shaft power for driving at least one accessory via at least power transfer arrangement.

14. A method according to claim 1, wherein said supplying step comprises supplying said bleed air to an air turbine and delivering power from said air turbine to a generator for supplying power to at least one aircraft system.

15. A method according to claim 1, further comprising using power generated by said pneumatically operated means to drive at least one of a generator, a starter/generator, a fuel pump, a deoiler, a PMA, a lube pump, and a hydraulic pump.

16. A method according to claim 1, wherein said air bleeding step and said bleed air supplying step reduces demand for mechanical shaft power from a high pressure rotor of said engine and lowers a compressor operating line, thereby allowing a transient excursion with improved stall margin.

17. A method according to claim 1, further comprising expanding bleed air exhaust through said pneumatically operated means to reduce exhaust temperature and velocity, thereby reducing exhaust noise and improving compatibility with an engine cowl structure.

18. A method according to claim 1, further comprising exhausting said bleed air from said pneumatically operated means into an under cowl area.

19. A method according to claim 1, further comprising stopping the supply of said bleed air once a minimum surge margin point in an acceleration characteristic is passed.

20. A system for generating accessory power from a gas turbine engine, said system comprising:

means for monitoring at least one parameter which provides information about an incipient change in power demand;

means for supplying bleed air from said engine during a transient state in response to said at least one monitored parameter; and

a pneumatically operated means for receiving said bleed air and for generating power to operate equipment onboard an aircraft.

21. A system according to claim 20, wherein said monitoring means comprises an electronic engine control device which receives at least one input signal about said incipient change in power demand.

22. A system according to claim 21, wherein said electronic engine control device comprises a full authority digital electronic control device.

23. A system according to claim 21, wherein said bleed air supply means comprises a control valve which is opened or modulated by a signal from said electronic engine control device.

24. A system according to claim 23, wherein said control valve in an open position allows bleed air from a high pressure compressor of said engine to flow to said pneumatically operated means.

25. A system according to claim 23, further comprising a feedback loop for transmitting a signal to said electronic engine control device representative of control valve position.

26. A system according to claim 20, wherein said pneumatically operated means comprises a pneumatically integrated generator for supplying electrical power to operate at least one accessory selected from the group consisting of a generator, a starter/generator, a fuel pump, a deoiler, a PMA, a lube pump, and a hydraulic pump.

27. A system according to claim 20, wherein said pneumatically operated means comprises a pneumatically integrated generator for supplying mechanical power to a gearbox for operating at least one accessory selected from the group consisting of a generator, a starter/generator, a fuel pump, a deoiler, a PMA, a lube pump, and a hydraulic pump.

28. A system according to claim 20, wherein said pneumatically operated means comprises an air turbine mounted on a gearbox for providing mechanical shaft power to said gearbox for operating at least one accessory selected from the group consisting of a generator, a starter/generator, a fuel pump, a deoiler, a PMA, a lube pump, and a hydraulic pump.

29. A system according to claim 20, wherein said pneumatically operated means comprises an air turbine connected to a gearbox shaft by a shaft and gear arrangement, said air turbine providing mechanical shaft power to said gearbox for operating at least one accessory selected from the group consisting of a starter/generator, a fuel pump, a deoiler, a PMA, a lube pump, and a hydraulic pump.

30. A system according to claim 20, wherein said pneumatically operated means comprises an air turbine connected to a gearbox and further comprising a generator attached to said gearbox and being driven by said air turbine.

31. A system according to claim 20, wherein said pneumatically operated means comprises an air turbine and further comprising a generator driven by said air turbine for supplying power to at least one system onboard an aircraft.

32. A system according to claim 20, wherein operation of said pneumatically operated means increases an amount of stall margin available to a high pressure compressor of said engine.